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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,196	07/14/2006	Kunitaka Momota	101523.0001US1	7582

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EXAMINER	
NGUYEN, NGOC YEN M	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,196	MOMOTA ET AL.	
	Examiner	Art Unit	
	Ngoc-Yen M. Nguyen	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7 and 9-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7 and 9-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3-7, 9-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 7, it is unclear if the limitation "with hydrochloric acid of pH 2 or lower" requires the hydrochloric acid to have a pH of 2 or lower or the reaction system to have a pH of 2 or lower. If the latter is true, it is unclear if the required pH is for the beginning, the ending or the entire time that the effluent reacts with calcium chloride solution. Also, in claim 1, "comparatively large size" is indefinite because it is unclear "large size" as compared with what.

In claims 6 and 12, there is no clear antecedent basis for "the reaction" and "the formed aqueous calcium chloride solution".

In claim 10, there is no clear antecedent basis for "the reaction", i.e. the reaction that produces calcium fluoride or the reaction between hydrochloric acid and calcium salt to form calcium chloride.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 7, 9 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 11-130,427.

JP '427 discloses a process for producing high purity calcium fluoride from a mixed acid aqueous solution obtained in the decomposition of a fluorine compounds such as fluorocarbon. The mixed acid is distilled to remove metal impurities (note abstract).

JP '427 discloses that the mixed acid contains both HF and HCl (note paragraph [001]). After the distillation step, the mixed acid solution B still contains both HF and HCl (note paragraph [0020]). Calcium chloride is added to the mixed acid solution B to precipitate calcium fluoride (note paragraph [0021]).

Since the mixed acid solution contains HCl and HCl is additionally formed (from the reaction between the calcium chloride with HF to form calcium fluoride and HCl, note equation in paragraph [0022]), the process as disclosed in JP '427 is considered to be "under an acidic condition with hydrochloric acid of pH 2 or lower" as required in the instant claims 1 and 7. It should be noted that as disclosed in the instant specification, page 13, lines 21-28, when the effluent contains hydrofluoric acid, "a large amount of hydrochloric acid naturally exist in a reaction system because hydrochloric acid is formed by the reaction of calcium chloride with hydrofluoric acid ...accordingly there is no need to take the trouble to supply hydrochloric acid".

Alternatively, if the instant claims 1 and 7 require the hydrochloric acid to have a pH of 2 or lower, the HCl as disclosed in JP '427 would inherently have the same low pH as the HCl in the claimed process.

Since the process of JP '427 has all the positive process steps as required in the claimed process, it would produce calcium fluoride particles having "comparatively large size with a purity of 98% or higher".

The process of JP '427 anticipates the claimed process.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-7, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-130,427 in view of Johansing, Jr. (5,705,140), optionally further in view of JP 51-110,498.

JP '427 discloses a process for producing calcium fluoride as stated above.

In the event that the pH in the process of JP '427 is not "2 or lower", JP '498 is applied to teach a process for recover fluorine values from waste liquor by adding a calcium compound at a pH of 2-3 (note claim 1). This range overlaps the claimed range at 2. With respect to the encompassing and overlapping ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art

at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ 549.

For the reaction temperature and the particle size of the calcium fluoride product, it would have been obvious to one of ordinary skill in the art to optimize the temperature for the process to obtain the best results and it is known in the art to produce precipitated product with large particle size so it can be easily separated from the remained solution.

The difference is JP '427 does not disclose the steps of producing calcium chloride from the HCl and recycling the calcium chloride to process of producing calcium fluoride.

Johansing '140 discloses a process for transformation of halogenated refrigerant gases (note title). The refrigerant gases react with oxygen and steam to form carbon dioxide and HF (note column 4, lines 11-33). Calcium chloride reacts with HF to form calcium fluoride and HCl (note reaction (d)). The HCl formed in reaction (d) is neutralized by the addition of purified calcium carbonate to form calcium chloride (note reaction (f). HCl can also react with calcium hydroxide to form calcium chloride (note

reaction (h). The produced calcium chloride can be used in the formation of high purity calcium fluoride according to reaction (d) (note column 5, line 66 to column 6, line 3 and column 6, lines 15-18

It would have been obvious to one of ordinary skill in the art at the time the invention was made to react the HCl, by-produced by the reaction between calcium chloride and HF to form calcium fluoride, in the process of JP '427 with calcium carbonate or calcium hydroxide to form calcium chloride which can be recycled back to the process producing calcium fluoride, as suggested by Johansing '140 because by doing so the cost of fresh calcium chloride can be minimized and the need to dispose toxic HCl can be avoided.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '427 in view of Johansing '140, optionally further in view of JP '498 as applied to claims 1, 3-7, 9-12 above, and further in view of Ohmi et al (5,362,461).

The difference not yet discussed is JP '427 does not disclose that the calcium fluoride can be used to produce HF.

Ohmi '461 discloses that it is well known in the art to produce HF by reacting calcium fluoride with sulfuric acid (note chemical reaction 1 in column 3).

It would have been obvious to one of ordinary skill in the art to use the calcium fluoride produced by the process of JP '427 as the reactant to produce HF as suggested by Ohmi '461 because using a product of one process as the reactant for the process is well the skill of the artisan.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/
Primary Examiner, Art Unit 1793

nmn
September 2, 2009